

A Prerequisite to Managing Karst Systems: A Model for Evaluating the Basic Elements of Karst Development

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Abstract

An understanding of karst systems and how they form and function is important for developing strategies to preserve, protect, and manage these systems and their associated resources. Karst systems form in a variety of geologic settings and hydrologic regimes. As the geologic and hydrologic cycles progress and change over time, the karst systems associated with them also evolve and change. The variety of conditions under which karst systems form, coupled with the continuing evolution of geologic conditions, make it impossible to assign one mechanism of speleogenesis and descriptive mode to address all existing karst systems. Despite the differences in form and development of karst types, all share several fundamental elements. These elements include lithology, solvent, porosity/fractures/fissures, gradient, and evolution through time. All karst systems can be related and compared based on these fundamental elements. To develop the basic principles of this approach, several different karst types (the Caribbean Isla de Mona and the Florida Suwannee River Karst) were comparatively evaluated to determine how these fundamental elements can be applied to each. It was determined that this approach is useful both in a descriptive and comparative sense in highlighting not just the differences between karst types but also in emphasizing their inherent similarities. In face of significant differences between these systems, the similarities teach us something about the fundamental nature of just what karst is about.